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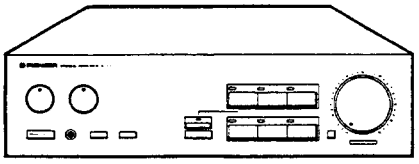
The future of sound and vision.

Service Manual



ORDER NO.
ARP1359

STEREO AMPLIFIER

A-331
A-331-S

MODEL A-331 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model		Power requirement	Export destination
	A-331	A-331-S		
KC	O	–	AC120V only	Canada
HE	O	–	AC220V, 240V (switchable) *	European continent
HB	O	–	AC220V, 240V (switchable) *	United Kingdom
HEZ	O	O	AC220V, 240V (switchable)	West Germany

* Change the primary wiring of the Power transformer.

- **This Service Manual is applicable to the A-331/KC, HE, HB and HEZ types.**
- **As to the HE, HB and HEZ types, please refer to page 25.**
- **A-331-S is silver versions of A-331.**

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1. SPECIFICATIONS

AMPLIFIER SECTION

Continuous Average Power Output is 40 Watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz, with no more than 0.02% total harmonic distortion.

**Measured pursuant to the Federal Trade Commission's Trade Regulation rules on Power Output Claims for Amplifiers.*

Continuous power output (both channels driven)
- 20 Hz to 20 kHz, T.H.D. 0.02%, 8 Ω ..... 40 W + 40 W

DIN continuous power output (both channels driven)
- 1 kHz, T.H.D. 1%, 8 Ω ..... 55 W + 55 W
- 1 kHz, T.H.D. 1%, 4 Ω ..... 72 W + 72 W

IEC continuous power output (both channels driven)
- 63 Hz to 12.5 kHz, T.H.D. 0.7%, 8 Ω ..... 53 W + 53 W
- 63 Hz to 12.5 kHz, T.H.D. 0.7%, 4 Ω ..... 70 W + 70 W

Dynamic power output (on EIA dynamic test signal)
- 8 Ω ..... 55 W + 55 W
- 4 Ω ..... 90 W + 90 W
- 2 Ω ..... 100 W + 100 W

Total harmonic distortion (measured by Audio Spectrum Analyzer)
- 20 Hz to 20 kHz, 40 W, 8 Ω 0.02%

Input sensitivity/impedance
- PHONO (MM) ..... 2.5 mV/50 kΩ
- CD, TUNER, VIDEO/AUX, TAPE ..... 150 mV/33 kΩ

PHONO overload level
- 1 kHz, T.H.D. 0.02% (MM) ..... 150 mV

Output level/impedance
- TAPE REC ..... 150 mV/2.2 kΩ

Frequency response
- PHONO (MM), 20 Hz to 20 kHz ..... ±0.3 dB
- CD, TUNER, VIDEO/AUX, TAPE, 5Hz to 80kHz ..... $^{+0}_{-3}$ dB

Tone control
- BASS ..... ±8 dB (100 Hz)
- TREBLE ..... ±8 dB (10 kHz)

Loudness contour (volume control set at −40dB position)
+ 7 dB (100 Hz)/+ 4 dB (10 kHz)

Signal-to-Noise ratio (IHF short circuit, A network)
- PHONO (MM, 5 mV input) ..... 88 dB
- CD (DIRECT) ..... 105 dB
- CD, TUNER, VIDEO/AUX, TAPE ..... 100 dB

Signal-to-Noise ratio (DIN, continuous power/50 mW)
- PHONO (MM) ..... 73 dB/60 dB
- CD (DIRECT) ..... 86 dB/63 dB
- CD, TUNER, VIDEO/AUX, TAPE ..... 86 dB/60 dB

Power Supply/Miscellaneous

Power requirements
- U.S., Canadian models ..... AC 120V, 60 Hz
- European model ..... a.c. 220 V~, 50/60 Hz
- U.K., Australian models ..... a.c. 240 V~, 50/60 Hz
- Other destination models ..... ~AC 110 V/120−127 V 220 V/240 V (switchable), 50/60 Hz

Power consumption
- European, U.K., Australian models ..... 410 W
- Canadian model ..... 330VA (CSA)

Dimensions ..... 420 (W) × 316.5 (D) × 120 (H) mm
16-1/2 (W) × 12-1/2 (D) × 4-3/4 (H) in

Weight ..... 7.0 kg (15 lb 7 oz)

Accessories

Operating instructions 1

- *Specifications and design subject to possible modification without notice due to improvements.*

TREBLE tone control

Use to adjust the high-frequency tone.
The center position is the flat (normal) position. When moved to the right, high-frequency tones are emphasized; when moved to the left, high-frequency tones are de-emphasized.

NOTE:
This function does not operate when the CD DIRECT FUNCTION switch is in the ON position.

BASS tone control

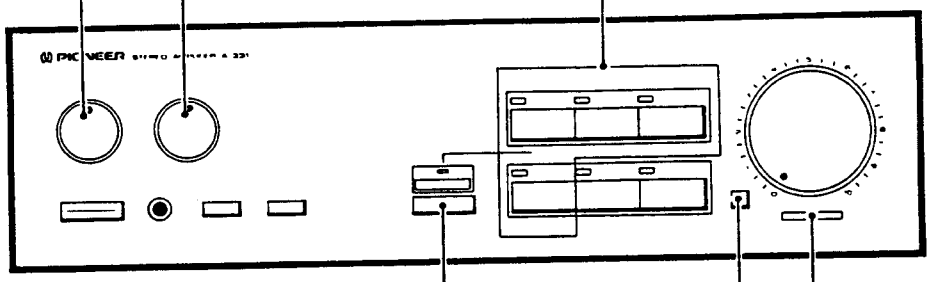
Use to adjust the low-frequency tone. The center position is the flat (normal) position. When moved to the right, low-frequency tones are emphasized; when moved to the left, low-frequency tones are de-emphasized.

NOTE:
This function does not operate when the CD DIRECT FUNCTION switch in the ON position.

INPUT selector switches/indicators

Use to select playback source.
[CD] — Press when listening to compact disc playback with a CD player.
[PHONO] — Press when listening to record playback on a turntable.
[TUNER] — Press when listening to AM or FM broadcasts with a tuner.
[VIDEO/AUX]— Press when listening to the programs from a component connected to the VIDEO/AUX terminals.

NOTE:
This function does not operate when the CD DIRECT FUNCTION switch is in the ON position.



CD DIRECT FUNCTION switch/indicator

Use this switch/indicator when you do not wish to pass the output from CD terminal equipment through the various frequency adjusting circuits (INPUT selector, TAPE MONITOR, BASS, TREBLE, BALANCE).
[ON] — When the switch is in this position, the indicator lights and the signals input from the CD terminals are reproduced without passing through the various frequency adjusting circuits.
This results in flat, pure sound which is a more faithful reproduction of the digital source.
[OFF] — When the switch is in this position, the indicator goes out, and the signal selected by INPUT selector or TAPE MONITOR switches is played back.

BALANCE control

Should normally be left in the center position. Adjust balance if the sound is louder from one of the speakers. If the right side is louder, move toward the LEFT position and if the left side is louder, move toward the RIGHT position.

NOTE:
This function does not operate when the CD DIRECT FUNCTION switch is in the ON position.

LOUDNESS switch

Use when listening at low volume levels.
[OFF] — Released position: Should normally be left in this position.
[ON] — Depressed position: Boosts low and high frequencies to give added punch to playback even at low volume.

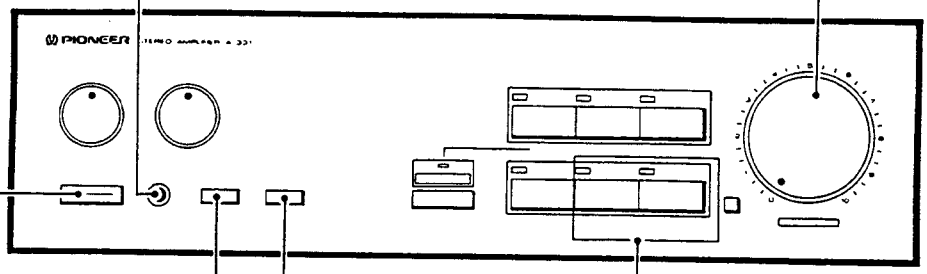
2. PANEL FACILITIES

FRONT PANEL

POWER switch
Press to turn power to the unit ON and OFF.

PHONES jack
When using headphones, insert their plug into this jack.

VOLUME control
Use to adjust volume level.



SPEAKERS A selector switch
Use this switch to listen to the speaker systems connected to the SPEAKERS A terminals.
[ON] – Depressed position: Sound is heard from the speaker systems.
[OFF] – Released position: No sound is heard from the speaker systems. Set to this position when listening with headphones.

SPEAKERS B selector switch
Use this switch to listen to the speaker systems connected to the SPEAKERS B terminals.
[ON] – Depressed position: Sound is heard from the speaker systems.
[OFF] – Released position: No sound is heard from the speaker systems. Set to this position when listening with headphones.

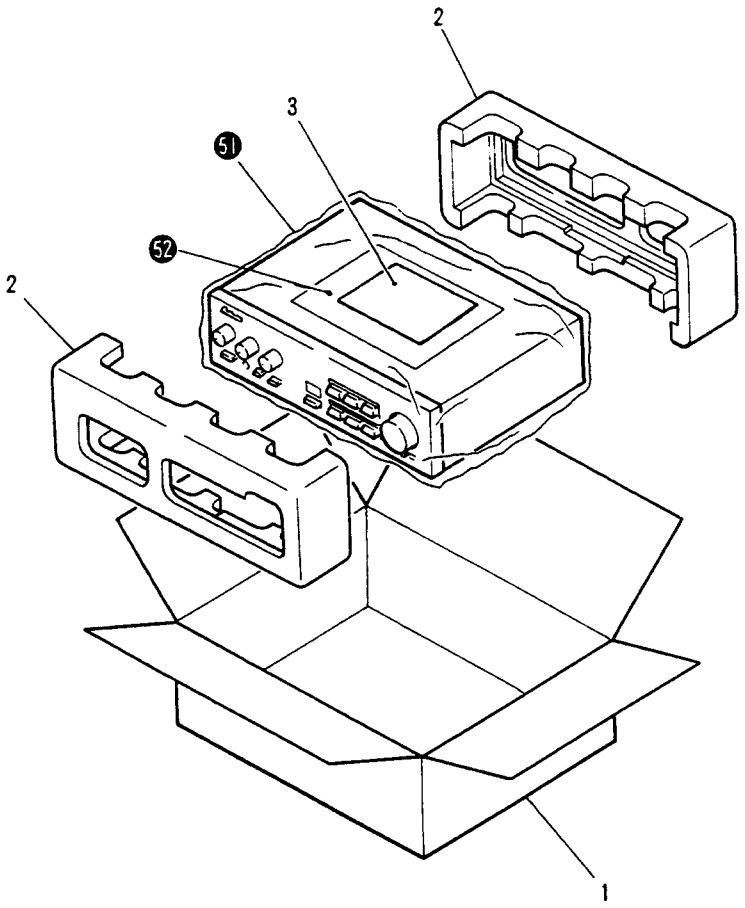
TAPE MONITOR switches/indicators
Use this switch to listen to tape playback, or to listen to the sounds being recorded during tape recording.
[TAPE 1] – Press when listening to the playback sound of the tape deck connected to the TAPE 1 PLAY terminals, or to monitor the sound being recorded on the tape deck connected to the TAPE 1 REC terminals.
[TAPE 2] – Press when listening to the playback sound of the tape deck connected to the TAPE 2 PLAY terminals, or to monitor the sound being recorded on the tape deck connected to the TAPE 2 REC terminals.

NOTE:
- *When both TAPE 1 and TAPE 2 are ON, the Tape of TAPE 2 can be played back or monitored.*
- *When listening to other than tape sound, keep this switch OFF (indicator OFF).*
- *This function does not operate when the CD DIRECT FUNCTION switch is in the ON position.*

3. PACKING

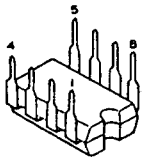
Parts List of Packing

Mark	No.	Part No.	Description
	1.	AHD1220	Packing case
	2.	AHA1015	Front rear pad
	3.	ARE1045	Operating instructions (English, French)
	51.		Seat
	52.		Warranty card

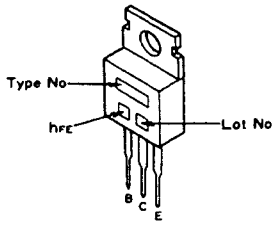


External Appearance of Transistors and ICs

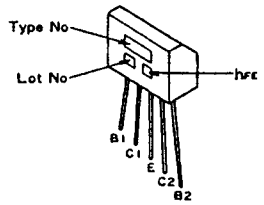
M5220P
M5210P



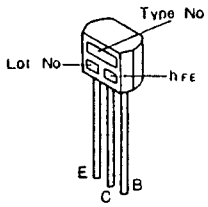
2SC2591
2SA1111



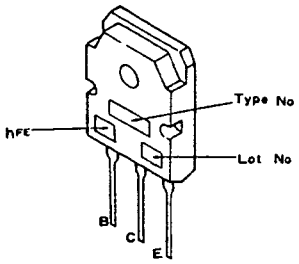
2SA979



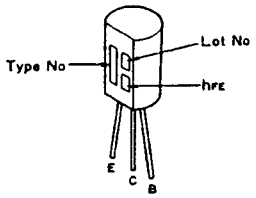
2SA1115
2SC2603



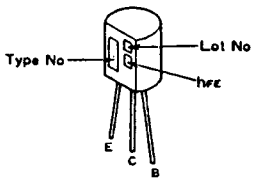
2SC3181N
2SA1264N



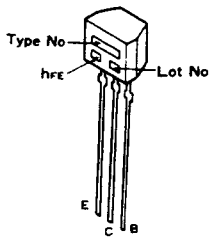
2SA1145
2SC1845



2SA992
2SC2705



2SC2458



4. EXPLODED VIEWS AND PARTS LIST

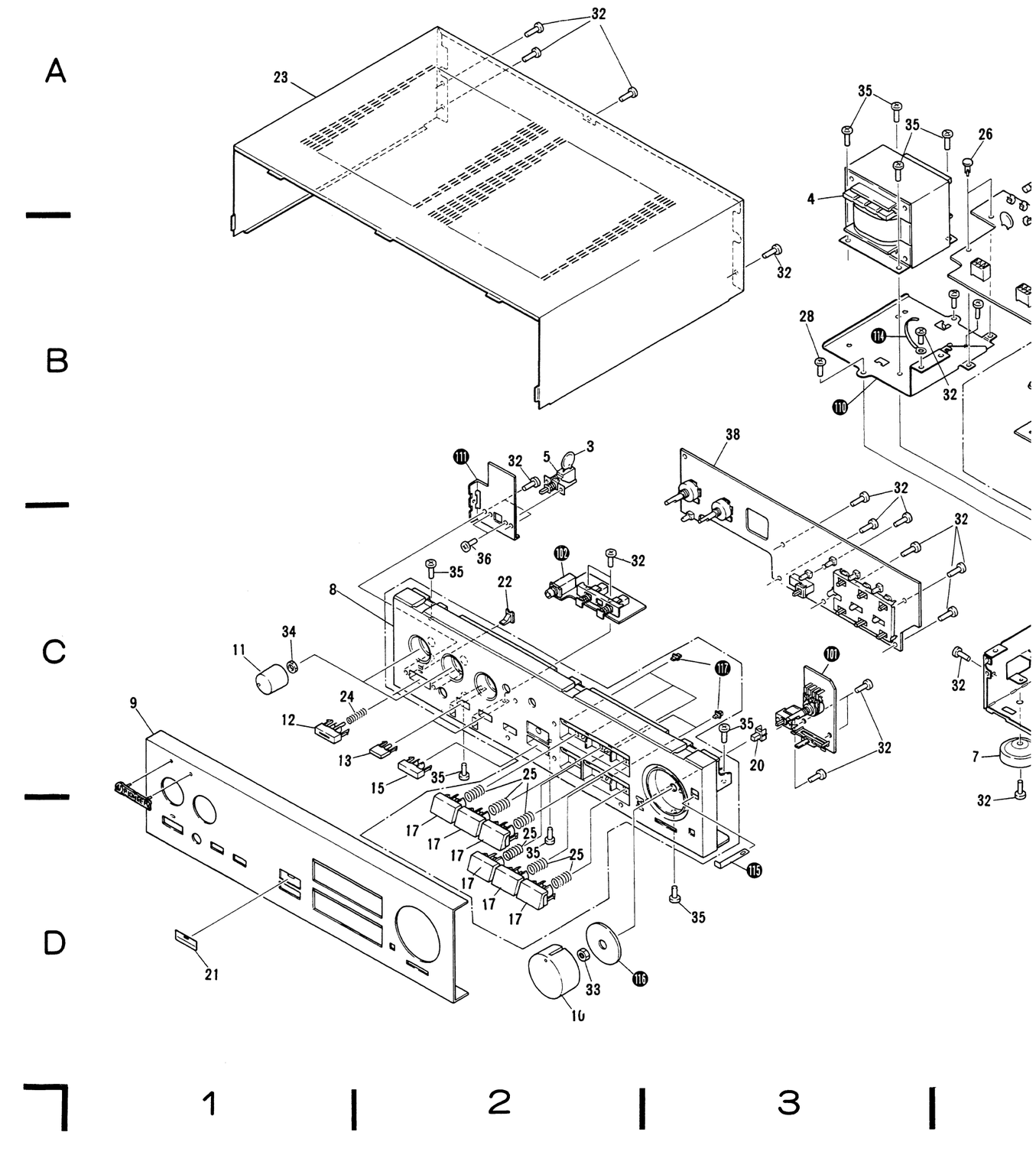
NOTES:

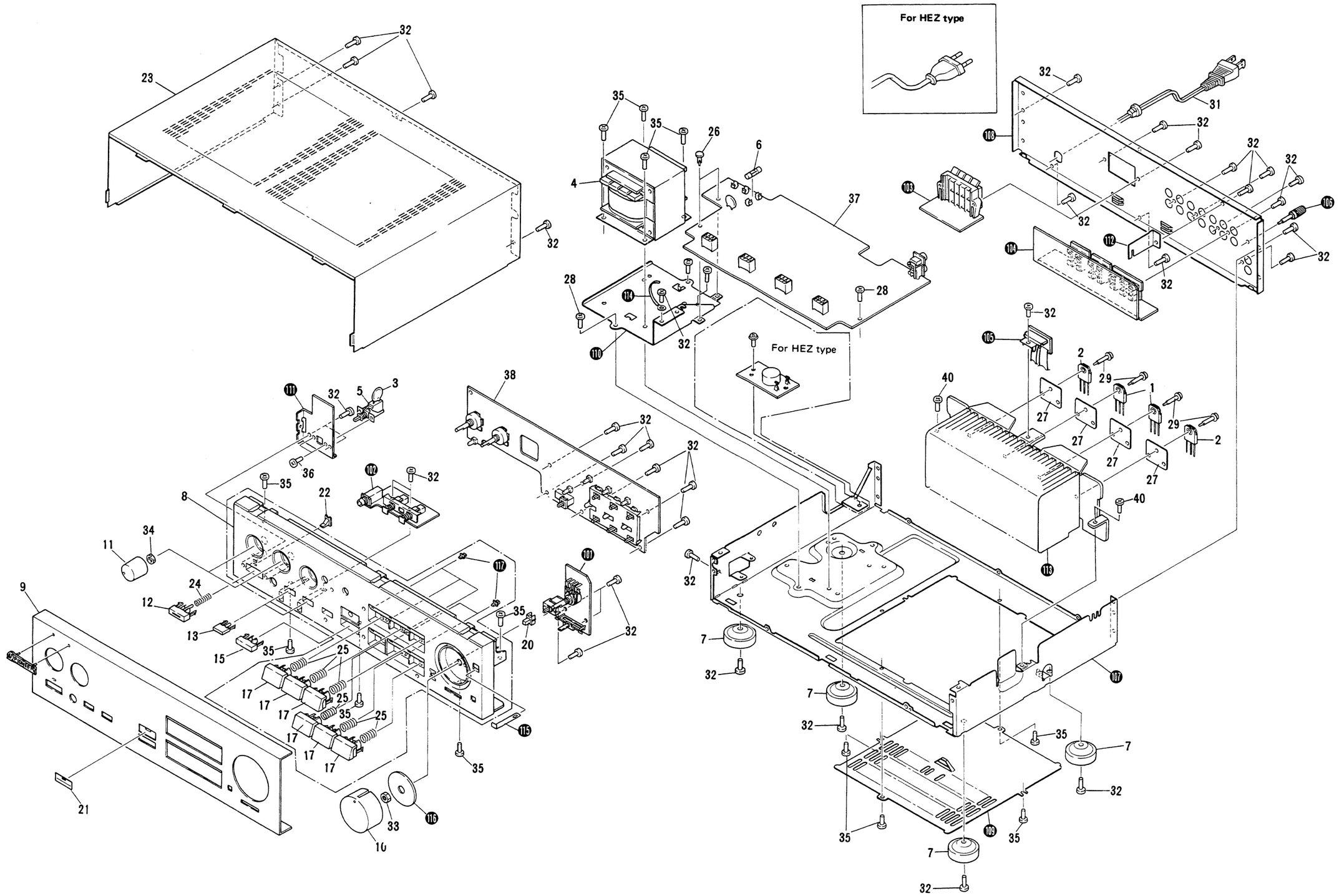
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Parts List of Exterior

Mark	No.	Part No.	Description
⚠ ★★	1.	2SA1264N	Transistor (Q3,Q4)
⚠ ★★	2.	2SC3181N	Transistor (Q1, Q2)
⚠	3.	ACG1003	Power Capacitor (C1 0.01, AC125V)
⚠ ★	4.	ATS1079	Power transformer (T1)
⚠ ★★	5.	ASG-552 (ASG-550)	Push switch (S1 POWER)
⚠ ★★	6.	AEK-125	Fuse (FU1 4A, 125V)
	7.	AEP-280	Leg assembly
	8.	AMD1009	Panel Base assembly
	9.	ANB1092	Front panel assembly
	10.	AAB1035	Knob (VOLUME)
	11.	AAB1028	Knob (TONE)
	12.	AAD1146	Knob (POWER)
	13.	AAD1061	Knob (SPEAKER)
	14.	.....	.....
	15.	AAD1063	Knob (CD DIRECT)
	16.	.....	.....
	17.	AAD1136	Function knob (PHONO, CD, TUNER, VIDEO/AUX, TAPE1, TAPE 2)
	18.	.....	.....
	19.	.....	.....
	20.	AAD1070	Knob (LOUDNESS)
	21.	AAK1216	CD Direct plate
	22.	AAT-110	Indicator lens C
	23.	ANE1059	Bonnet
	24.	ABH1015	Coil spring
	25.	ABH1019	Coil spring
	26.	AEC-525	Nylon rivet
	27.	AEP-313	Mica seat
	28.	ABA1011	Screw
	29.	ABA-258	Screw
	30.	.....	.....

Mark	No.	Part No.	Description
⚠	31.	ADG-089	AC power cord
	32.	BBZ30P080FZK	Screw
	33.	NK70FUC	Nut
	34.	NK90FUC	Nut
	35.	ABA-298	Screw
	36.	VMZ30P060FMC	Screw
	37.	AWZ1240	AF Complex assembly
	38.	AWZ1440	Tone, Function assembly
	39.	.....	.....
	40.	ABA-297	Screw
	101.		Volume assembly
	102.		Speaker switch assembly
	103.		SP Terminal assembly
	104.		Pin jack assembly
	105.		Transistor assembly
	106.		Terminal (GND)
	107.		Chassis
	108.		Rear panel
	109.		Bottom plate
	110.		Transformer frame
	111.		Switch holder
	112.		P.C.B. holder
	113.		Heat sink
	114.		Binder
	115.		Plate (EARTH)
	116.		Earth ring
	117.		Indicator lens C




For HEZ type
For HEZ type
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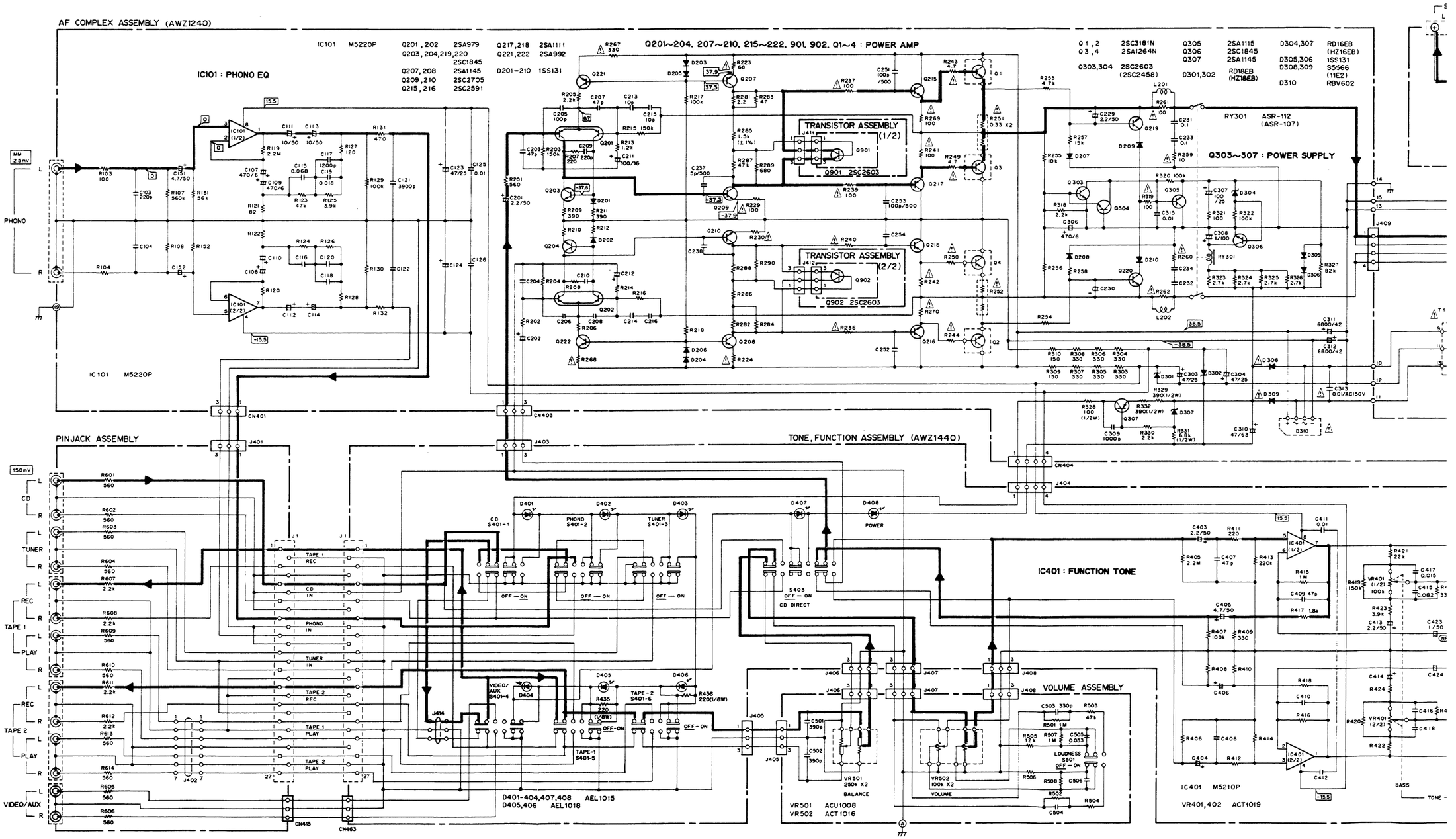
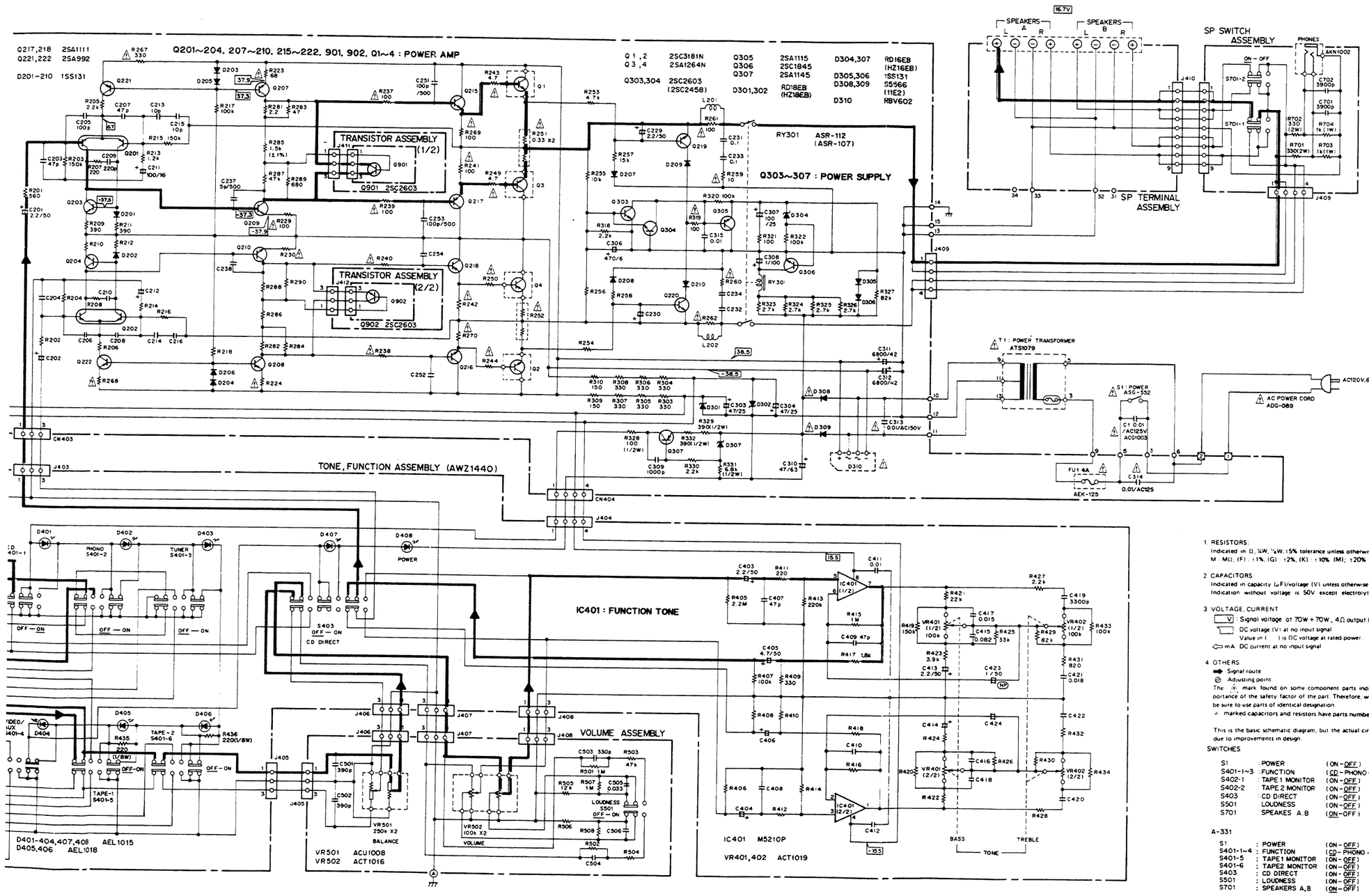
5. SCHEMATIC DIAGRAM





1. RESISTORS:
Indicated in Ω, ¼W, ½W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M) : ±20% tolerance

2. CAPACITORS
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT
V : Signal voltage of 70W + 70W, 4Ω output (1kHz)
DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power
mA DC current at no input signal

4. OTHERS
Signal route
Adjusting point
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
⚠ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES

S1	: POWER	(ON – OFF)
S401-1~3	: FUNCTION	(CD – PHONO – TUNER)
S402-1	: TAPE 1 MONITOR	(ON – OFF)
S402-2	: TAPE 2 MONITOR	(ON – OFF)
S403	: CD DIRECT	(ON – OFF)
S501	: LOUDNESS	(ON – OFF)
S701	: SPEAKES A,B	(ON – OFF)

A-331

S1	: POWER	(ON – OFF)
S401-1~4	: FUNCTION	(CD – PHONO – TUNER – VIDEO/AUX)
S401-5	: TAPE1 MONITOR	(ON – OFF)
S401-6	: TAPE2 MONITOR	(ON – OFF)
S403	: CD DIRECT	(ON – OFF)
S501	: LOUDNESS	(ON – OFF)
S701	: SPEAKERS A,B	(ON – OFF)

6. P.C. BOARD CONNECTION DIAGRAM

NOTE

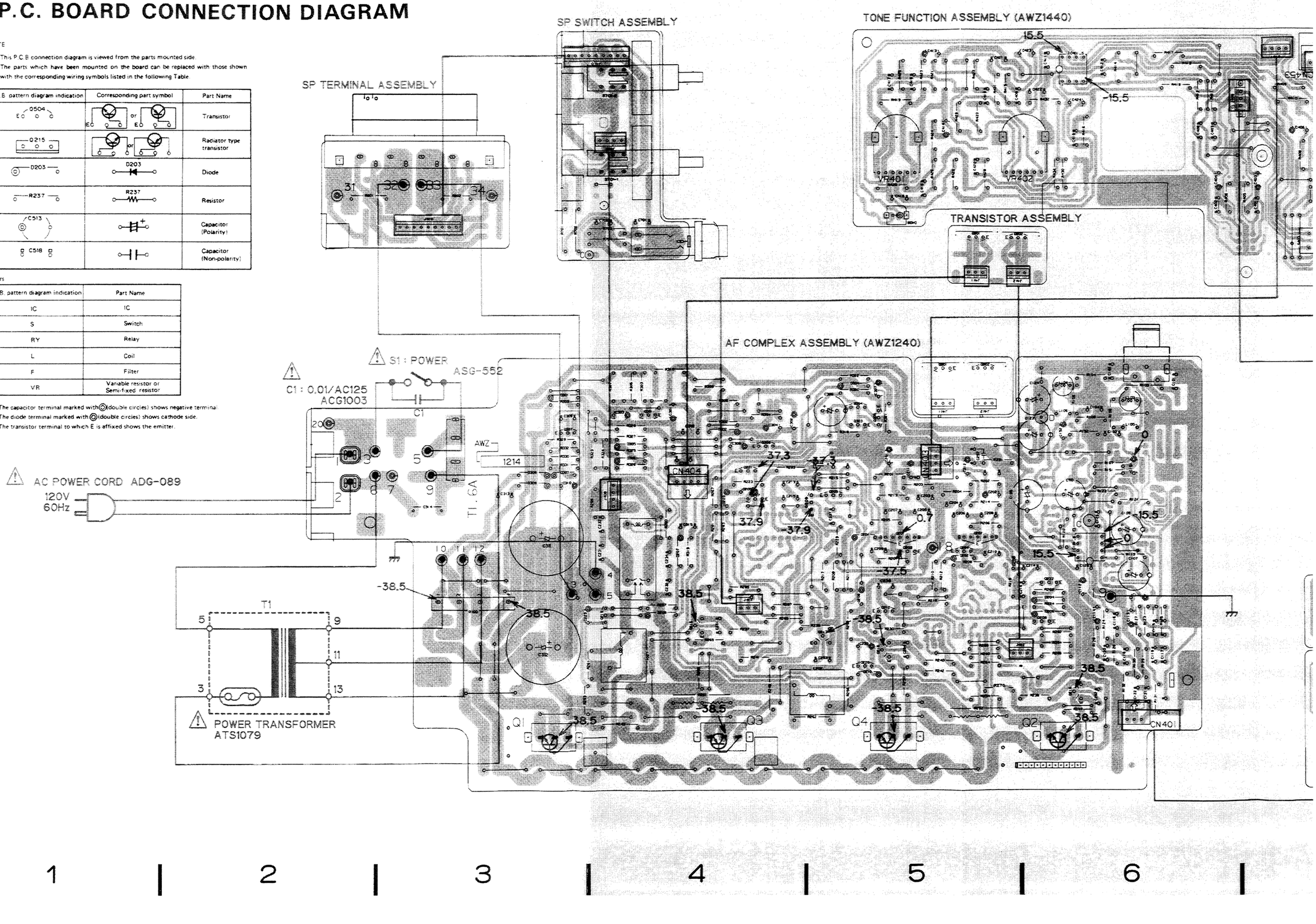
1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 (E C B)	C B E or E B C	Transistor
Q215 (E C B)	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with ⓞ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.



SP SWITCH ASSEMBLY

TONE FUNCTION ASSEMBLY (AWZ1440)

TRANSISTOR ASSEMBLY

AF COMPLEX ASSEMBLY (AWZ1240)

VOLUME ASSEMBLY

PINJACK ASSEMBLY

7. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Miscellaneous Parts

P.C. BOARD ASSEMBLY

Mark	Symbol & Description	Part No.
	AF Complex assembly	AWZ1240
	Tone, Function assembly	AWZ1440
	Volume assembly	
	Speaker switch assembly	
	Transistor assembly	
	SP Terminal assembly	
	Pin jack assembly	

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠ ★★	Q3, Q4	2SA1264N
⚠ ★★	Q1, Q2	2SC3181N

SWITCH

Mark	Symbol & Description		Part No.
⚠ ★★	S1	Push switch (POWER)	ASG-552 (ASG-550)

TRANSFORMER

Mark	Symbol & Description		Part No.
⚠ ★	T1	Power transformer (120V)	ATS1079

CAPACITOR

Mark	Symbol & Description		Part No.
	C1	Power capacitor (0.01μF/125V)	ACG1003

OTHERS

Mark	Symbol & Description		Part No.
⚠		AC power cord	ADG-089
⚠ ★★	FU1	Fuse (4A/125V)	AEK-125

AF Complex Assembly (AWZ1240)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	M5220P
★★	Q217C, Q218C	2SA1111
★★	Q305	2SA1115
★★	Q207, Q208, Q307	2SA1145
★★	Q201, Q202	2SA979
★★	Q221, Q222	2SA992
★★	Q203, Q204, Q219, Q220, Q306	2SC1845
★★	Q215C, Q216C	2SC2591
★★	Q303, Q304	2SC2603 (2SC2458)
★★	Q209, Q210	2SC2705
⚠ ★	D310	RBV602
★	D304, D307	RD16EB (HZ16EB)
★	D301, D302	RD18EB (HZ18EB)
⚠ ★	D308, D309	S5566 (11E2)
★	D201–D210, D305, D306	1SS131

RELAY

Mark	Symbol & Description		Part No.
	RY301	Relay	ASR-112 (ASR-107)

COILS

Mark	Symbol & Description		Part No.
	L201, L202	AF choke coil	ATH1004

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C314 (0.01μF/AC125V)	ACG1003
⚠	C313 (0.01μF/AC150V)	ACG1005
	C311, C312 (6,800μF/42V)	ACH1019
	C237, C238	CCCSL050C500
	C213–C216	CCCSL100D50
	C205, C206	CCCSL101J50
	C251–C254	CCCSL101K500
	C209, C210	CCCSL221J50
	C203, C204, C207, C208	CCCSL470J50
	C103, C104	CCDSL221J50
	C308	CEAS010M100
	C111–C114	CEAS100M50
	C307	CEAS101M25
	C229, C230	CEAS2R2M50
	C151, C152	CEAS4R7M50
	C123, C124, C303, C304	CEAS470M25
	C310	CEAS470M63
	C107–C110, C306	CEAS471M6
	C211, C212	CEYA101M16
	C201, C202	CEYA2R2M50
	C309	CKCYB102K50
	C315	CKCYF103Z50
	C125, C126	CKDYF103Z50
	C231–C234	CQMA104K50
	C117, C118	CQMA122J50
	C119, C120	CQMA183J50
	C121, C122	CQMA392K50
	C115, C116	CQMA683J50

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R251, R252 (0.33Ω x 2 5W)	ACN-139
	R328, R329, R332, R331	RD1/2PM□□□J
⚠	R223, R224, R241, R242, R259–R262, R267–R270	RD1/4PMF□□□J
	R285, R286	RN1/4PQ1501F
⚠	R229, R230, R237–R240, R243, R244, R249, R250, R319	RFA1/4PS□□□J
	Other resistors	RD1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	2P terminal (PHONO)	AKB-119
	Transistor socket	AKH-017

Tone, Function Assembly (AWZ1440)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC401	M5210P
★	D401–D404, D407, D408	AEL1015
★	D405, D406 (TAPE 1, 2)	AEL1018

SWITCH

Mark	Symbol & Description	Part No.
★★	S401 Push switch (FUNCTION)	ASG1013
★★	S403 Push switch (CD DIRECT)	SECV6S

CAPACITORS

Mark	Symbol & Description	Part No.
	C407–C410	CCCSL470J50
	C423, C424	CEANP010M50
	C403, C404, C413, C414	CEAS2R2M50
	C405, C406	CEAS4R7M50
	C411, C412	CKCYF103Z50
	C417, C418	CQMA153K50
	C421, C422	CQMA183K50
	C419, C420	CQMA332K50
	C415, C416	CQMA823K50

RESISTORS

Mark	Symbol & Description	Part No.
★	VR401, VR402 Variable resistor (100 kΩ x 2: BASS, TREBL)	ACT1019
	R435, R436	RD1/8PM221J
	Other resistors	RD1/4PM□□□J

Volume Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	S501 Push switch (LOUDNESS)	SEAV2S

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504	CKCYB331K50
	C501, C502	CKCYB391K50
	C505, C506	CQMA333K50

RESISTORS

Mark	Symbol & Description	Part No.
★	VR502 Variable resistor (100 kΩ x 2: VOLUME)	ACT1016
★	VR501 Slide volume (250 kΩ x 2: BALANCE)	ACU1008
	R501–R508	RD1/4PM□□□J

Speaker Switch Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	S701 Push switch (SPEAKERS)	SUL6LXBXSC

8. FOR HE, HB, HEZ AND A-331-S/HEZ TYPES

8.1 .CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

The A-331/HE, HB, HEZ and A-331-S/HEZ types are the same as A-331/KC type with the exception of the following sections:

Mark	Symbol & Description	Parts No.					Remarks
		A-331/KC	A-331/HE	A-331/HB	A-331/HEZ	A-331-S/HEZ	
	AF complex assembly	AWZ1240	AWZ1240	AWZ1240	AWZ1214	AWZ1214	
	SP terminal assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
	Pin jack assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
	Line filter assembly	...	...	...	AWT1003	AWT1003	
⚠	AC power cord	ADG-089	ADG-068	ADG-063	ADG-068	ADG-068	
⚠ ★★	FU1 Fuse (4A/125V)	AEK-125	...	...	...	...	
⚠ ★★	FU1 Fuse (T1.6A/250V)	...	AEK-405	AEK-510	AEK-405	AEK-405	
⚠ ★	Power transformer	ATS1079	ATS1041	ATS1041	ATS1041	ATS1041	
	Operating instructions (English/French)	ARE1045	ARE1045	...	...	...	
	Operating instructions (German/Italian)	...	ARC1042	...	ARC1042	ARC1042	
	Operating instructions (English)	...	...	ARB1059	...	...	
	Operating instructions (German)	...	ARC1043	...	...	...	
	Screw (For line filter)	...	...	...	ABA-256	ABA-256	
	Knob (VOLUME)	AAB1035	AAB1035	AAB1035	AAB1035	AAB1029	
	Knob (TONE)	AAB1028	AAB1028	AAB1028	AAB1028	AAB1030	
	Knob (POWER)	AAD1146	AAD1146	AAD1146	AAD1146	AAD1153	
	Knob (SPEAKER)	AAD1061	AAD1061	AAD1061	AAD1061	AAD1154	
	Knob (CD DIRECT)	AAD1063	AAD1063	AAD1063	AAD1063	AAD1155	
	Knob (LOUDNESS)	AAD1070	AAD1070	AAD1070	AAD1070	AAD1156	
	CD direct plate	AAK1216	AAK1216	AAK1216	AAK1216	AAK1271	
	Packing case	AHD1220	AHD1220	AHD1220	AHD1220	AHD1221	
	Panel base assembly A	AMD1009	AMD1009	AMD1009	AMD1009	AMD1013	
	Bonnet	ANE1059	ANE1059	ANE1059	ANE1059	ANE1071	
	Front panel assembly	ANB1092	ANB1092	ANB1092	ANB1092	ANB1111	
	Function knob (PHONO, CD, TUNER, VIDEO/AUX, TAPE 1, TAPE 2)	AAD1136	AAD1136	AAD1136	AAD1136	AAD1171	

8.2 ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Line Filter Assembly (AWT1003)

FILTER

Mark	Symbol & Description		Part No.
⚠	L1	Line filter	ATF-151

SP Terminal Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C801–C804	CKDYB472K500

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R801, R802	RD1/4PMF100J

OTHERS

Mark	Symbol & Description	Part No.
	8P terminal (SPEAKERS)	AEK-111

Pin Jack Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C601–C614	CKDYB391K50

RESISTORS

Mark	Symbol & Description	Part No.
	R601, R602	RDR1/4PM561J
	R603–R614	RD1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	4P terminal (TAPE 1, 2)	AKB-115
	6P terminal (CD, TUNER, VIDEO/AUX)	AKB-117

AF Complex Assembly (AWZ1214)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC101	M5220P
	Q217C, Q218C	2SA1111
	Q305	2SA1115
	Q207, Q208, Q307	2SA1145
	Q201, Q202	2SA979
	Q221, Q222	2SA992
	Q203, Q204, Q219, Q220, Q306	2SC1845
	Q215C, Q216C	2SC2591
	Q303, Q304	2SC2603 (2SC2458)
	Q209, Q210	2SC2705
⚠	D310	RBV602
	D304, D307	RD16EB (HZ16EB)
	D301, D302	RD18EB
⚠	D308, D309	S5566 (11E2)
	D201–D210, D305, D306	1SS131

RELAY

Mark	Symbol & Description		Part No.
★★	RY301	Relay	ASR-112 (ASR-117)

CAPACITORS

Mark	Symbol & Description	Part No.
	C701, C702	CKCYB392K50

RESISTORS

Mark	Symbol & Description	Part No.
	R703, R704	RS1PMF102J
	R701, R702	RS2LMF331J

OTHERS

Mark	Symbol & Description	Part No.
	Pone jack (HEAD PHONE)	AKN1002

Transistor Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q901, Q902	2SC2603

SP Terminal Assembly

OTHERS

Mark	Symbol & Description	Part No.
	8P terminal (SPEAKERS)	AKE-111

Pin Jack Assembly

RESISTORS

Mark	Symbol & Description	Part No.
	R601, R602	RDR1/4PM561J
	R603–R614	RD1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	4P terminal (TAPE 1, 2)	AKB-115
	6P terminal (CD, TUNER, VIDEO/ AUX)	AKB-117

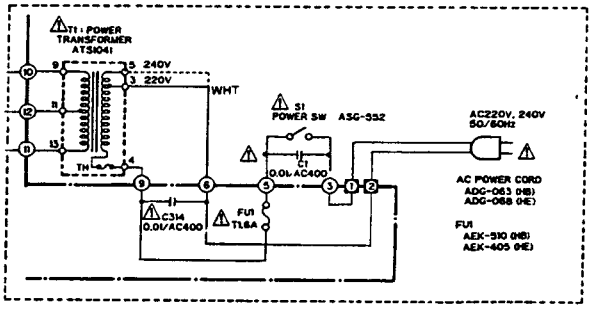
Line voltage selection (HE, HEZ and HB types)

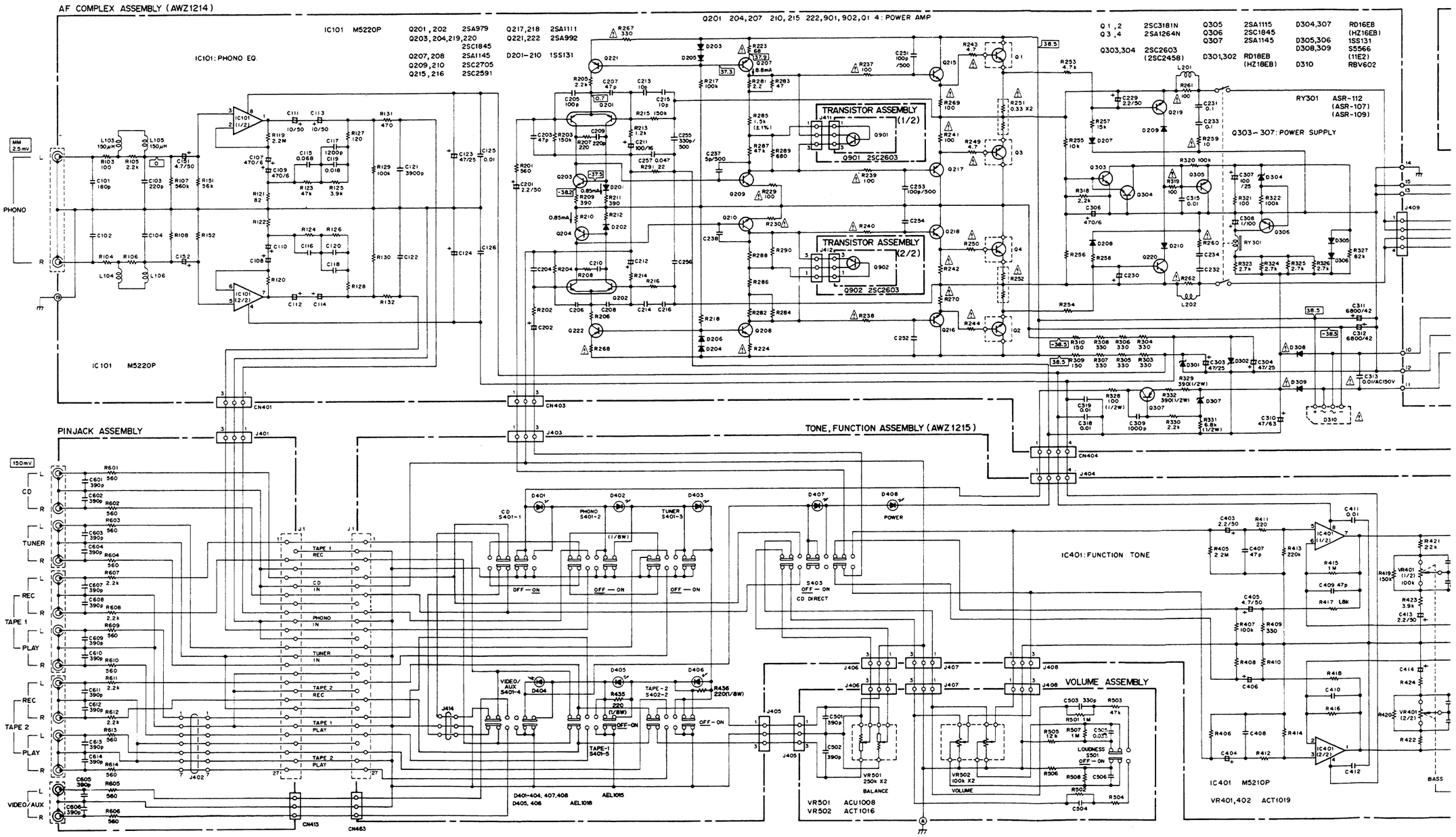
Line voltage can be changed with following steps.

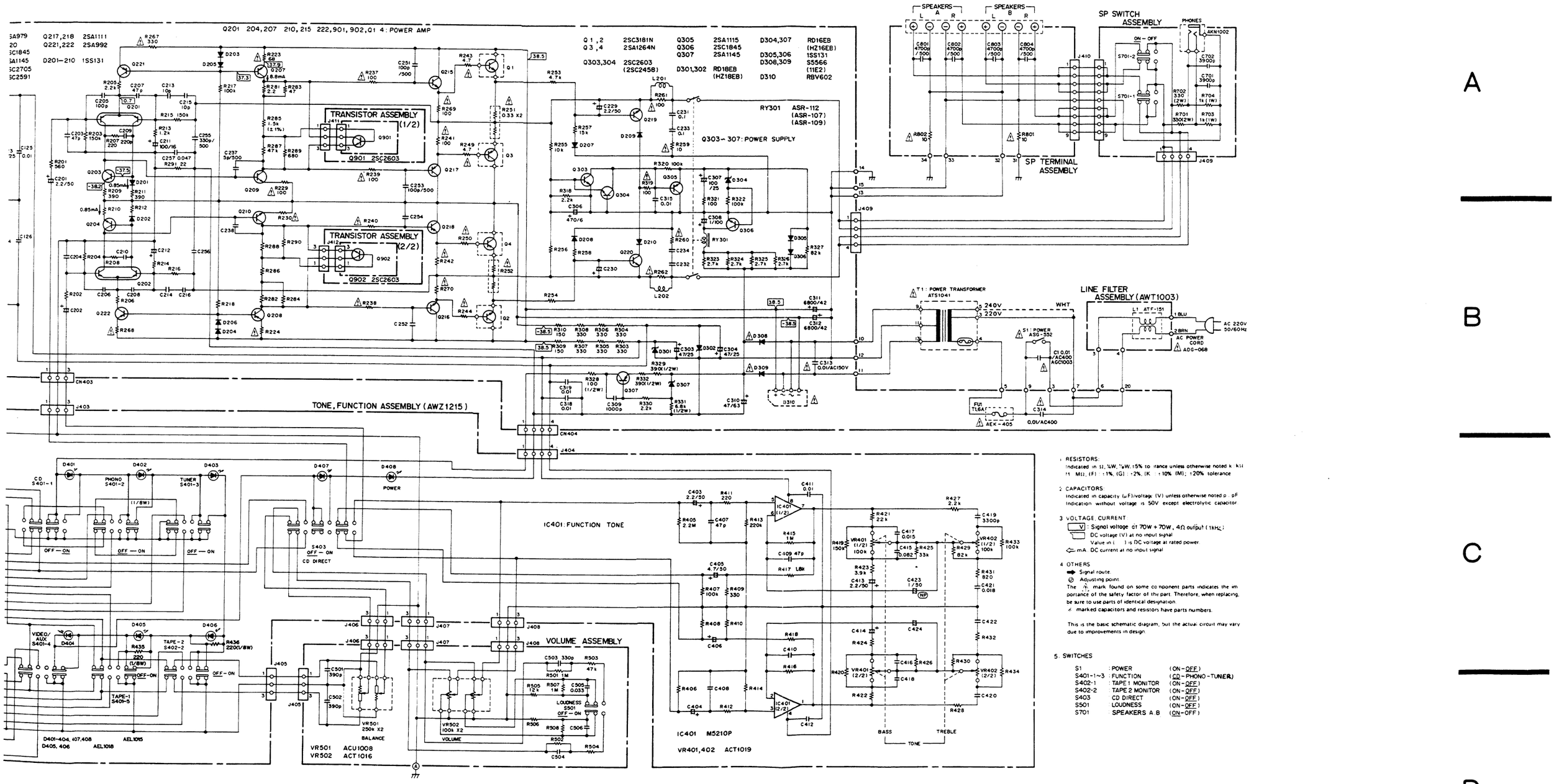
1. Desconnect the AC power cord.
2. Remove the top cover.
3. Change the connection wire (To Power transformer) of Terminal No. 3 (WHITE) as follows.

Voltage	Terminal No. 3	Terminal No. 5
220V	White wire	. . . . .
240V	. . . . .	White wire

For HE and HB types




AF COMPLEX ASSEMBLY (AWZ1214)
IC101 M5220P
Q201,202 2SA979
Q203,204,219,220 2SC1845
Q207,208 2SA1145
Q209,210 2SC2705
Q215,216 2SC2591
Q217,218 2SA1111
Q221,222 2SA992
D201-210 1SS131
IC101: PHONO EQ.
Q201 204,207 210, 215 222,901,902,01 4: POWER AMP
Q1,2 2SC3181N
Q3,4 2SA1264N
Q303,304 2SC2603 (2SC2458)
Q305 Q306 Q307 2SA1115 2SC1845 2SA1145
D301,302 RD18EB (HZ18EB)
D304,307 RD16EB (HZ16EB)
D305,306 1SS131
D308,309 S5566 (11E2)
D310 RBV602
TRANSISTOR ASSEMBLY (1/2) 0901 2SC2603
TRANSISTOR ASSEMBLY (2/2) 0902 2SC2603
RY301 ASR-112 (ASR-107) (ASR-109)
Q303-307: POWER SUPPLY
PHONO
CN401
CN403
PINJACK ASSEMBLY
TONE, FUNCTION ASSEMBLY (AWZ1215)
CN404
J404
CD
TUNER
REC
TAPE 1
PLAY
REC
TAPE 2
PLAY
VIDEO/AUX
TAPE 1 REC
CD IN
PHONO IN
TUNER IN
TAPE 2 REC
TAPE 1 PLAY
TAPE 2 PLAY
CN413
CN463
D401 CD S401-1
D402 PHONO S401-2
D403 TUNER S401-3
D407 S403 CD DIRECT
D408 POWER
D404 VIDEO/AUX S401-4
D405 TAPE-2 S402-2
D406
TAPE-1 S401-5
D401-404, 407,408 AEL1015
D405, 406 AEL1016
IC401: FUNCTION TONE
VOLUME ASSEMBLY
VR501 ACU1008
VR502 ACT1016
BALANCE
VOLUME
LOUDNESS S501
BASS
IC401 M5210P
VR401,402 ACT1019



1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k: kΩ, M: MΩ, (F): ±1%, (G): ±2%, (K): ±10% (M): ±20% tolerance.

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p: pF. Indication without voltage is 50V except electrolytic capacitor.

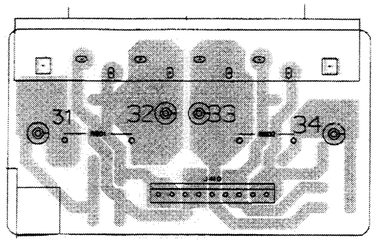
3. VOLTAGE, CURRENT
V: Signal voltage of 70W + 70W, 4Ω output (1kHz)
DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
mA: DC current at no input signal

4. OTHERS
Signal route.
Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES

S1	: POWER	(ON–OFF)
S401-1~3	: FUNCTION	(CD–PHONO–TUNER)
S402-1	: TAPE 1 MONITOR	(ON–OFF)
S402-2	: TAPE 2 MONITOR	(ON–OFF)
S403	CD DIRECT	(ON–OFF)
S501	LOUDNESS	(ON–OFF)
S701	SPEAKERS A,B	(ON–OFF)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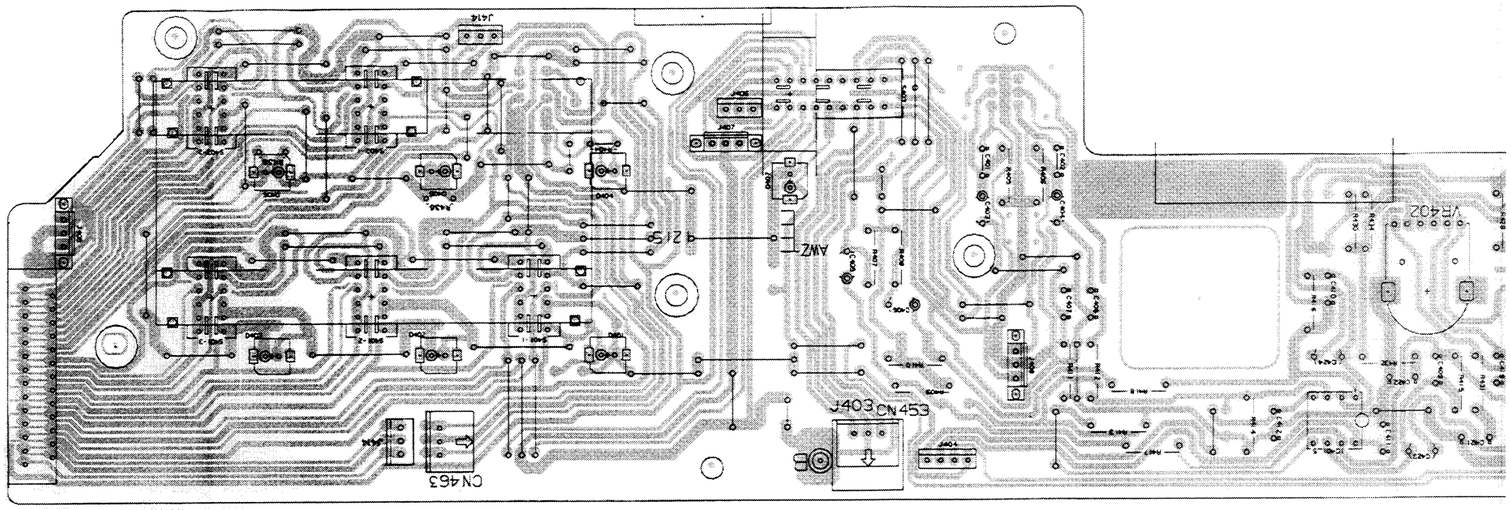
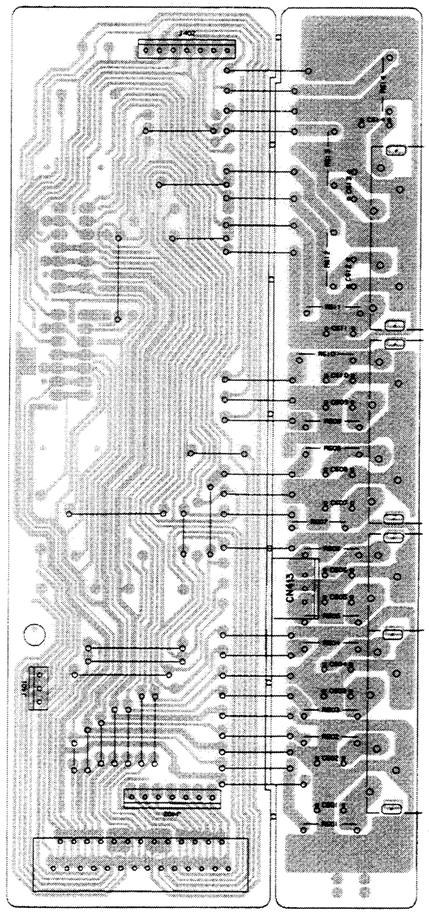
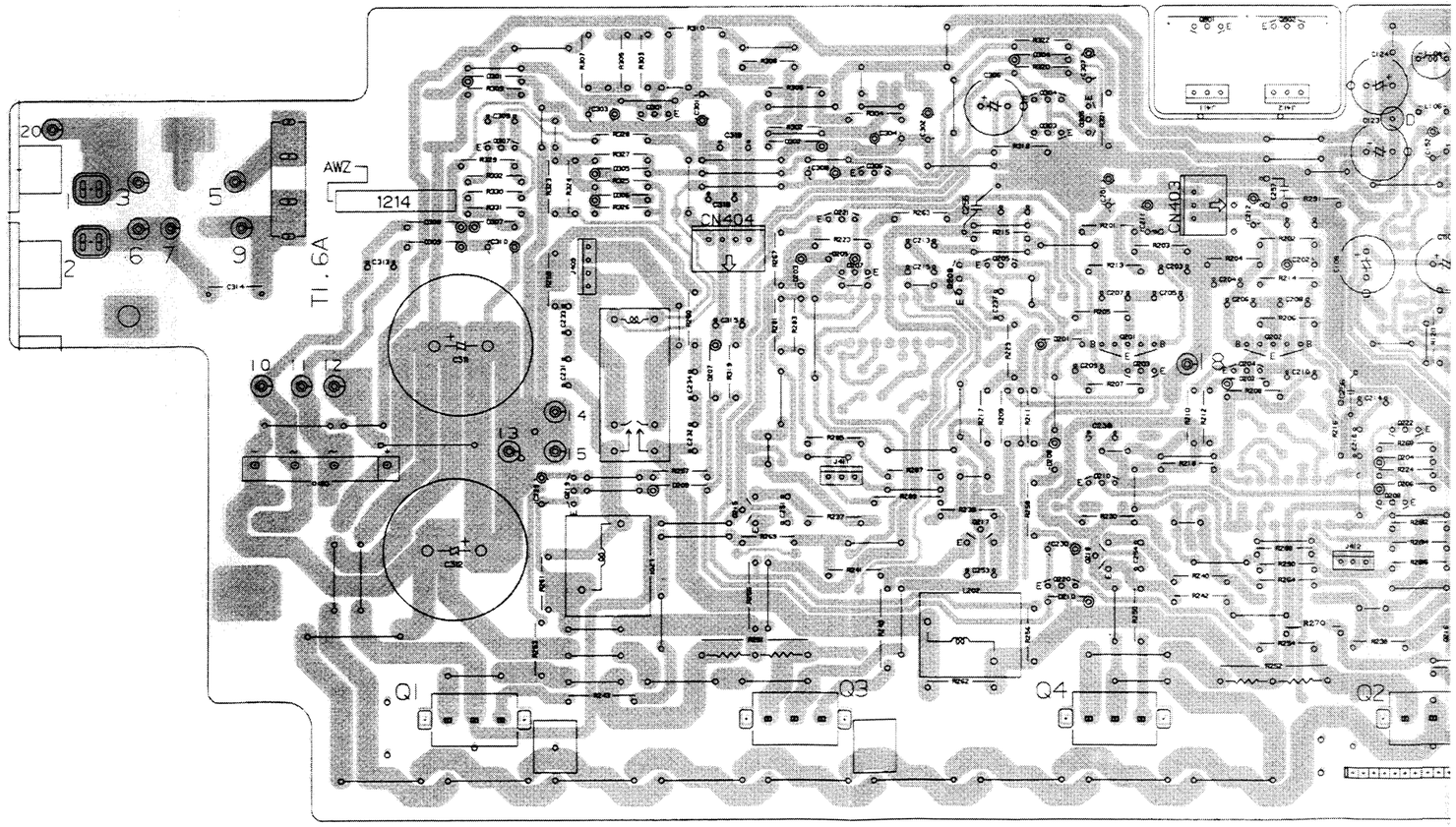
32
33
34


J414
AWZ
1215
CN463
J403
CN453
VR402


CN453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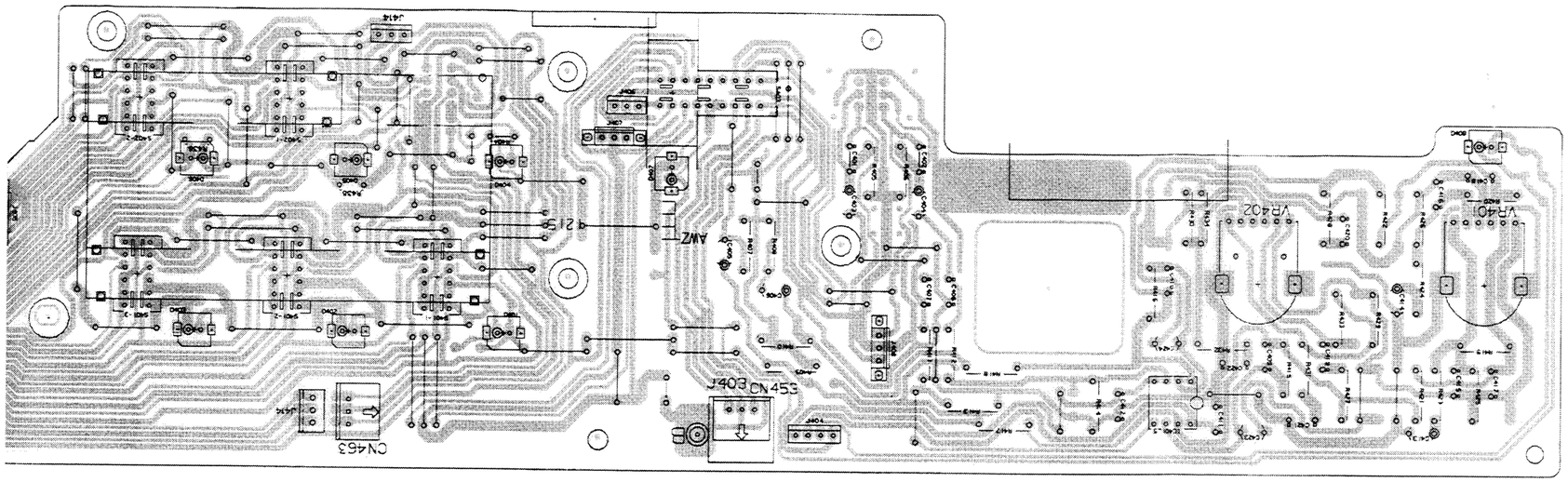
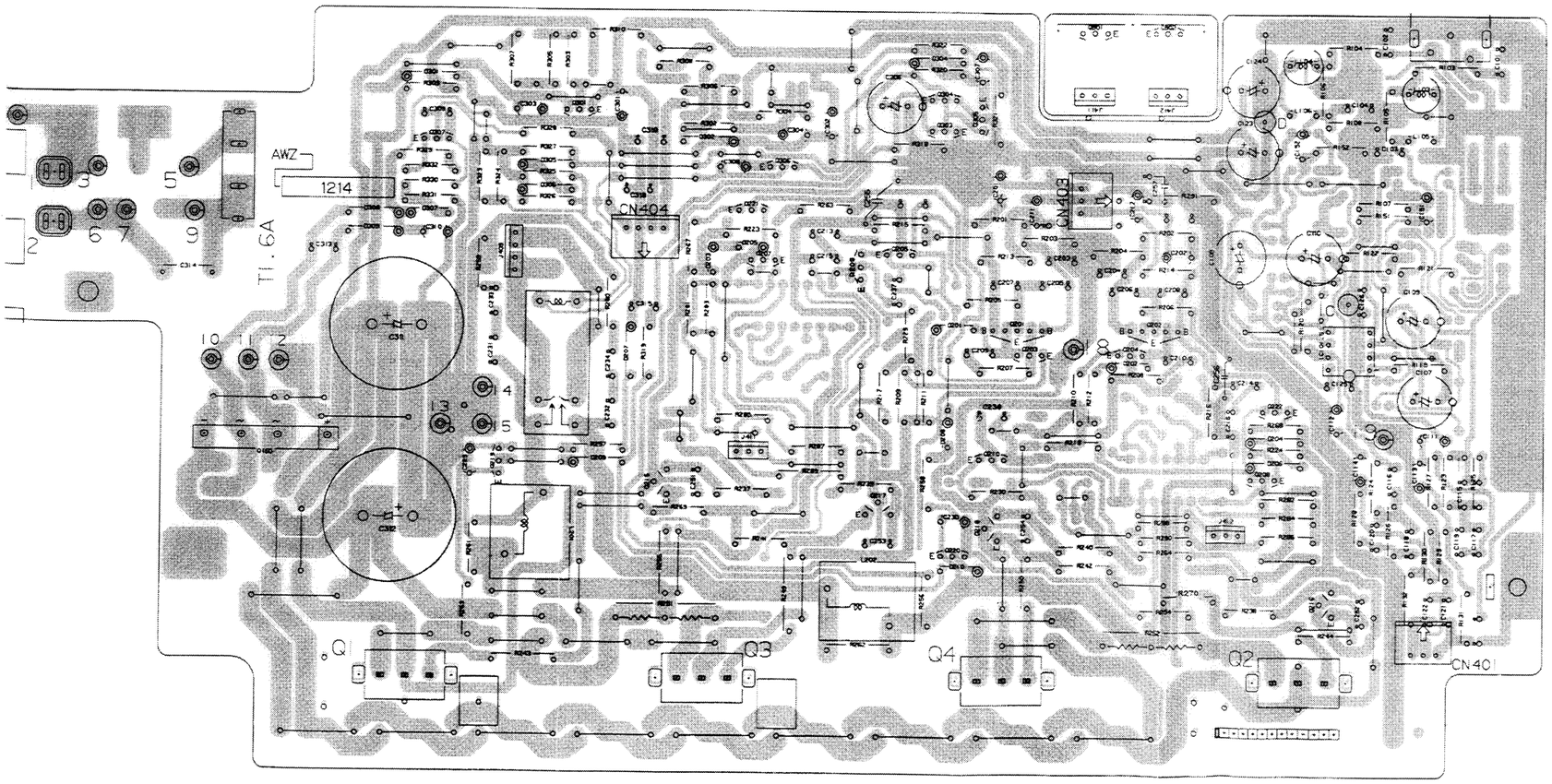
3
2
AWZ
1214
CN404
CN403
T1.6A
10
4
5
Q1
Q3
Q4
Q2





NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504	or	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513		Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with ⓞ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

COILS

Mark	Symbol & Description	Part No.
	L201, L202 AF choke coil (5.3μH)	ATH1009
	L103—L106 Inductor (150μH)	LAU151K

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C314 (0.01μF/AC400V)	ACG1003
⚠	C313 (0.01μF/AC150V)	ACG1005
	C311, C312 (6800μF/42V)	ACH1019
	C237, C238	CCCSL050C500
	C213—C216	CCCSL100D50
	C205, C206	CCCSL101J50
	C251—C254	CCCSL101K500
	C209, C210	CCCSL221J50
	C203, C204, C207, C208	CCCSL470J50
	C101, C102	CCDSL181J50
	C103, C104	CCDSL221J50
	C308	CEAS010M100
	C111—C114	CEAS100M50
	C307	CEAS101M25
	C229, C230	CEAS2R2M50
	C151, C152	CEAS4R7M50
	C123, C124, C303, C304	CEAS470M25
	C310	CEAS470M63
	C107—C110, C306	CEAS471M6
	C211, C212	CEYA101M16
	C201, C202	CEYA2R2M50
	C309	CKCYB102K50
	C315, C318, C319	CKCYF103Z50
	C255, C256	CKCDYB331K50
	C125, C126	CKCDYF103Z50
	C257	CKCDYF473Z50
	C231—C234	CQMA104K50
	C117, C118	CQMA122J50
	C119, C120	CQMA183J50
	C121, C122	CQMA392K50
	C115, C116	CQMA683J50

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R251, R252 (0.33Ω x 2 5W)	ACN-139
	R328, R329, R331, R332	RD1/2PM□□□J
⚠	R229, R230, R241, R242, R259—R262, R269—R270, R319	RD1/4PMF□□□J
	R285, R286	RN1/4PQ1501F
⚠	R237—R240, R243, R244, R249, R250	RFA1/4PS□□□J
	Other resistors	RD1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	2P terminal (PHONO)	AKB-119
	Transistor socket	AKH-017